IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND claim 44 in accordance with the following:

1. (ORIGINAL) An apparatus for controlling an output of a laser diode in an optical medium apparatus, comprising:

a sampling circuit sampling said output of said laser diode at a predetermined frequency and generating a sampled signal; and

an arithmetic unit receiving said sampled signal, generating a control power value applied to the laser diode in response to said sampled signal, and modifying said output of said laser diode in response to said control power value.

2. (ORIGINAL) The apparatus of claim 1, further comprising a controller connected to said sampling circuit, generating a sampling control signal representing said predetermined frequency, and said sampling circuit sampling said output at said predetermined frequency in accordance with said sampling control signal.

3. (ORIGINAL) The apparatus of claim 2, said controller generating a write control signal, said arithmetic unit generating said power level control signal in response to said write control signal, said controller generating said sampling control signal a predetermined period of time after said write control signal has been generated from said controller.

4. (ORIGINAL) The apparatus of claim 1, said arithmetic unit comprising a memory storing a reference power value, said arithmetic unit generating said control power value in accordance with either one of said sampled signal and a reference power value.

5. (ORIGINAL) The apparatus of claim 4, further comprising a controller generating a selecting signal representing said reference power value, said arithmetic unit generating said control power value in response to said selecting signal.

6. (ORIGINAL) The apparatus of claim 1, said sampling circuit comprising:

a detecting unit monitoring an output level of the laser diode;

a current/voltage converter coupled to said detecting unit converting said output level of said laser diode into a voltage signal; and

an analog to digital converter sampling said voltage signal of said current/voltage converter at said predetermined frequency.

7. (ORIGINAL) The apparatus of claim 6, further comprising a preprocessor interposed between said current/voltage converter and said analog to digital converter, controlling the gain of said voltage signal output from said current/voltage converter.

8. (ORIGINAL) The apparatus of claim 7, wherein said preprocessor comprises:

a read/write gain controller controlling the gain of said voltage signal output from said current/voltage converter in a read/write operational mode, generating a gain controlled power level signal; and

a gain select switch selecting either one of said voltage signal of said current/voltage converter and said gain controlled power level signal of said read/write gain controller, and generating a gain controlled output signal and providing the selected output to said analog/digital converter].

9. (ORIGINAL) The apparatus of claim 8, wherein said preprocessor comprises:

a low-pass filter filtering said gain controlled output signal of said gain select switch, generating a low-pass filter signal;

a peak holder holding a peak value from said gain controlled output signal of said gain select switch, and generating a peak holding signal;

a bottom holder holding a bottom value from said gain controlled output signal of said gain select switch, and generating a bottom holding signal; and

a mode select switch connected to said gain select switch, said low pass filter, said peak holder, and said bottom holder, selecting one of said gain controlled output signal, said low-pass filter signal, said peak holding signal, and said bottom holding signal, and providing the selected output to the analog/digital converter.

10. (ORIGINAL) The apparatus of claim 1, further comprising a controller connected to said sampling circuit and said arithmetic unit, said controller including:

a write pulse generator generating power control signals based on a non-return to zero inverted (NRZI) signal and generating a write control signal indicating power applied to said laser diode based on said power control signals; and

a sampling controller connected to said write pulse generator, generating a selection signal, controlling said sampling circuit and said arithmetic unit based on said write control signals generated by said write pulse generator .

11. (ORIGINAL) The apparatus of claim 10, further comprising a delay delaying said write control signal transmitted from said write pulse generator to said sampling controller and providing said sampling controller with a delayed write control pulse, and controlling said sampling controller to generate said selection signal in accordance with said delayed write control signal.

12. (ORIGINAL) The apparatus of claim 10, further comprising:

an interface connected to an external source, receiving interface signals including a clock signal, a read/write control signal, said NRZI signal and a land/groove determination signal; and

an APC controller connected between said interface and said write pulse generator and said sampling controller controlling said write pulse generator and said sampling controller in response to said interface signals.

13. (ORIGINAL) The apparatus of claim 1, wherein said arithmetic unit comprises:

a reference power selector having reference registers storing reference power values, and generating a reference power value so as to control a selected power value of said output of said laser diode;

a control power selector having control registers storing control power values, generating a control power value;

a subtracter connected to said sampling circuit and said reference power selector, measuring a difference between said reference power value and said power values provided by said sampling circuit, generating a difference signal;

an adder connected to said control power selector and said subtractor, adding said difference signal to said control power value, and generating an added signal; and

a demultiplexer connected to said adder, selecting one of said control registers so as to store said added signal in said one of said control registers.

14. (ORIGINAL) The apparatus of claim 13, further comprising a divider connected between said subtracter and said adder, said divider reducing said difference signal by a predetermined amount and providing a reduced difference signal to said adder.

15. (ORIGINAL) The apparatus of claim 13, further comprising an averaging unit averaging said sampled signal of said sampling circuit and providing an average control signal to said subtracter, said subtracter generating said difference signal in response to said average

control signal and said reference power value.

16. (ORIGINAL) The apparatus of claim 15, wherein said average power value control signal of said averaging unit is transmitted to a micro processor.

17. (ORIGINAL) The apparatus of claim 13, further comprising:

a controller generating a selection signal;

said reference power selector comprising:

a first multiplexer selecting one of said reference registers, and

a second multiplexer selecting one of said control registers and providing said control power value stored in said one of said control registered to said adder, wherein said first and second multiplexers and said demultiplexer are synchronized by said selection signal generated by said controller.

18. (ORIGINAL) The apparatus of claim 17, further comprising:

a third multiplexer connected to said control registers, selecting one of said control registers according to a write control signal generated from said controller; and

a digital/analog converter connected to said third multiplexer, converting an output of said third multiplexer into an analog signal and providing said analog signal to said laser diode.

19. (ORIGINAL) The apparatus of claim 17. further comprising a data output terminal connected to said control power selector, outputting said selected control power value stored in said selected control register to an outside of said arithmetic unit.

20. (ORIGINAL) The apparatus of claim 17, further comprising a data input terminal connected to said control power selector, said control power value being stored in said selected control register when transmitted to said control power selector through said data input terminal.

21. (ORIGINAL) The apparatus of claim 20, further comprising a fourth multiplexer connected between said adder and said control power selector, generating said control power value in response to one of said reference power value and said added signal, said control power selector storing one of said reference power value and said added signal in one of said

control registers.

22. (ORIGINAL) An apparatus for controlling an output of a laser diode, comprising:

a sampling circuit receiving said output of said laser diode, sampling said output of said laser diode, and generating a sampled signal; and

an arithmetic unit connected to said sampling circuit and said laser diode, generating a power value control signal to said laser diode in response to said sampled signal.

23. (ORIGINAL) The apparatus of claim 22, further comprising a controller connected to said sampling circuit, generating a sampling control signal representing one of sampling frequencies, said sampling circuit sampling said output of said laser diode at said one of said sampling frequencies in response to said sampling control signal.

24. (ORIGINAL) The apparatus of claim 23, said sampled signal varying in accordance with said one of said sampling frequencies.

25. (ORIGINAL) The apparatus of claim 23, wherein said controller is connected to said arithmetic unit and generates a first write control signal, said sampling control signal, a second write control signal in sequence, said arithmetic unit generating an initial power value control signal in response to said first write control signal while generating said power value control signal in response to said sampled signal and said second write control signal.

26. (ORIGINAL) The apparatus of claim 25, said diode generating said output in response to said initial power value control signal while generating a second output in response to said power value control signal.

27. (ORIGINAL) The apparatus of claim 22, said arithmetic unit generating a second power value control signal to said laser diode, said laser diode generating said output in response to said second power value control signal while generating a second output in response to said power value control signal.

28. (ORIGINAL) The apparatus of claim 22, said laser diode generating a second output in response to said power value control signal, said second output being different from said output.

29. (ORIGINAL) The apparatus of claim 22, said sampling circuit comprising an analog to digital converter converting said output of said laser diode into a sampled digital signal having a frequency, said arithmetic unit generating a power value control signal to said laser diode in response to said sampled digital signal.

30. (ORIGINAL) An apparatus for controlling an output of a laser diode, comprising:
a sampling circuit sampling said output at a frequency to generate a sampled signal; and
said laser diode modifying said output in response to said sampled signal.

31. (ORIGINAL) The apparatus of claim 30, further comprising a controller connected to said sampling circuit, generating a sampling control signal representing said frequency, said sampling circuit sampling said output of said laser diode in response to said sampling control signal.

32. (ORIGINAL) The apparatus of claim 31, wherein said frequency varies in accordance with said sampling control signal.

33. (ORIGINAL) The apparatus of claim 31, further comprising:
an arithmetic unit connected to said sampling circuit and said laser diode, generating a power value control signal to said laser diode in response to said sampled signal; and
said controller connected to said arithmetic unit, generating a first write control signal, said sampling control signal, a second write control signal in sequence, said arithmetic unit generating an initial power value control signal in response to said first write control signal while generating said power value control signal in response to said sampled signal and said second write control signal.

34. (ORIGINAL) The apparatus of claim 30, said sampling circuit comprising an analog to digital converter converting said output of said laser diode into a sampled digital signal having a frequency, said laser diode generating said modified output in response to said sampled digital signal.

35. (ORIGINAL) An apparatus for controlling an output of a laser diode, comprising:
a detecting unit receiving said output, and generating a first signal having a first

frequency in response to said output of said laser diode; and

a sampling circuit connected between said detecting unit and said laser diode, sampling said power level signal at a second frequency to generate a sampled signal, said laser diode modifying the output in response to said sampled signal.

36. (ORIGINAL) The apparatus of claim 35, said second frequency of said sampled signal being greater than said first frequency of said output of said laser diode.

37. (ORIGINAL) The apparatus of claim 35, further comprising an arithmetic unit connected between said sampling unit and said laser diode, generating an initial power value control signal and a second power value control signal, said laser diode generating said output in response to said initial power value control signal while generating said second output in response to said second power control signal, said initial power value control signal being generated regardless of said sampled signal.

38. (ORIGINAL) The apparatus of claim 35, said sampling circuit comprising an analog to digital converter for converting said output of said laser diode into a sampled digital signal having a frequency, said laser diode generating said modified output in response to said sampled digital signal.

39. (ORIGINAL) A laser diode controlling apparatus, comprising:

a laser diode generating an output; and

a controller receiving and controlling said output, said controller and said laser diode being included in one integrated circuit.

40. (ORIGINAL) A laser diode controlling apparatus, comprising:

a laser diode mounted in a pickup device and generating an output: and

a controller controlling said output and attached to said pickup device, both said controller and said laser diode being formed in a single body.

41. (ORIGINAL) The apparatus of claim 40, wherein said controller comprises:

a sampling circuit sampling and holding said output of said laser diode; and

said controller modifying said output in response to said sampled and held output.

42. (ORIGINAL) The apparatus of claim 41, wherein said sampling circuit comprises an analog to digital converter converting said output of said laser diode into a sampled signal, and said controller controlling said laser diode in response to said sampled signal.

43. (ORIGINAL) The apparatus of claim 41, wherein said sampling circuit samples said output at a predetermined frequency greater than that of said output.

44. (CURRENTLY AMENDED) The apparatus of claim 40, wherein said controller samples and holds said output of said laser diode at a predetermined position for a period of time, compares said sampled and held output with a reference ~~poser~~ power value, and controls said output in accordance with said sampled and held output.

45. (ORIGINAL) A method of controlling an optical output of a laser diode in an optical recording and reproducing apparatus, comprising:

generating a power level signal in accordance with said optical output;

sampling said power level signal with a sampling frequency to generate a sampled signal; and

modifying said output in response to said sampled signal.

46. (ORIGINAL) The method of claim 45, further comprising:

generating a write control signal and a sampling control signal, said write signal generated a predetermined period of time after said sampling control signal has been generated;

sampling said power level signal in response to said sampling control signal; and

generating said optical output from said laser diode in response to said write control signal and said sampled signal.

47. (ORIGINAL) A method in a laser diode controller, comprising:

generating an output from a laser diode;

sampling and holding said output of said laser diode at a predetermined position for a period of time;

comparing said sampled and held output with a reference poser value; and

controlling said output in accordance with said sampled and held output.